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NOV - 1 1996
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Via Messenger

Andy Firth
Legal Counsel
Disabilities Issues Task Force
Federal Communications Commission
2025 M Street, N.W., Room 6338-A
Washington, D.C. 20002

Dear Mr. Firth:

This firm represents ReSound Corporation, the fourth largest hearing health care company in the world and the world's leading supplier of programmable hearing aids. ReSound is an active member of numerous hearing health care community groups, including SHHH (Self-Help for the Hard of Hearing), the American Speech Language and Hearing Association, and the Academy of Audiology.

Because of your active involvement in disabilities issues, I am writing on behalf of ReSound to call your attention to the Commission's rulemaking proceeding in ET Docket No. 96-102, in which the Commission is considering providing for unlicensed "NII/SUPERNet" operations in the 5 GHz frequency band. ReSound has developed technology for a portion of the spectrum proposed to be allocated for NU/SUPERNet, at 5.850-5.875 GHz (which ReSound terms the "Quiet Band") that holds particular promise in offering advanced solutions for the hearing impaired.

As set forth in its Comments and Reply Comments in the NII/SUPERNet proceeding (copies of which are provided herewith), ReSound has urged the Commission not to permit

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NII/SUPERNet operations in the Quiet Band because of the harmful interference such operations would cause to Industrial, Scientific and Medical equipment operating in the band, including ReSound's new technology. ReSound welcomes any efforts by the Disabilities Task Force that would assist ReSound in preserving the Quiet Band for ISM purposes, including hearing devices.

Should you have any questions or if you would like any additional information regarding ReSound, please do not hesitate to call me.

Very truly yours,

E. Ashton Johnston
for PAUL, HASTINGS, JANOFSKY & WALKER, LLP

Enclosures
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AUG 14 1996

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of the Commission's	)	ET Docket No. 96-102
Rules to Provide for Unlicensed	)	RM-8648
NII/SUPERNet Operations in the	)	RM-8653
5 GHz Frequency Range	)	

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REPLY COMMENTS of
RESOUND CORPORATION

Carl W. Northrop
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August 14, 1996

CONTENTS

SUMMARY

ReSound's principal concern in this proceeding is the effect that NII/SUPERNet devices may have on the 5.850-5.875 GHz band. In its Reply, ReSound principally responds to comments that assert that NII/SUPERNet operations can co-exist at 5.850-5.875 GHz. Many commenters mistakenly assume that spread sprectrum transmitters permitted under Section 15.247 of the Commission's rules currently operate in the 5.850-5.875 GHz band. In fact, they do not, and no commenter has addressed potential interference with equipment permitted under Section 15.249. Because the record shows that a 350 MHz NII/SUPERNet allocation is excessive, the 5.850-5.875 GHz band should be excluded.

ReSound believes the NII/SUPERNet concept can be accommodated and can co-exist with existing users, provided that NII/SUPERNet devices are not permitted to operate in the 5.850-5.875 GHz band, and that ISM equipment continues to be accorded primary status in the 5.725-5.875 GHz band. ReSound also believes that the record supports the Commission's proposal to restrict NII/SUPERNet devices to low power operations.

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of the Commission's	)	ET Docket No. 96-102
Rules to Provide for Unlicensed	)	RM-8648
NII/SUPERNet Operations in the	)	RM-8653
5 GHz Frequency Range	)	

REPLY COMMENTS of
RESOUND CORPORATION

ReSound Corporation ("ReSound"), by its attorneys and pursuant to Section 1.415(c) of the Commission's Rules, hereby submits its reply to the Comments filed with the Commission in response to the Notice of Proposed Rule Making (the "NPRM") in the above-captioned proceeding. The following is respectfully shown:

I. Overview

1. In the NPRM, the Commission proposed to allocate spectrum in portions of the 5 GHz frequency band for use by unlicensed, high-speed wireless "NII/SUPERNet" devices. Forty-three parties, representing a diverse cross-section of interests in various portions of the subject band, filed comments. A substantial number of commenters, including ReSound, either use or manufacture equipment for use in the upper portion of the subject band (5.725 to 5.875

GHz), which currently has a primary allocation for Industrial, Scientific, and Medical ("ISM") devices. These commenters include amateur radio operators[1/] and manufacturers of spread spectrum equipment operating in the 5.725-5.850 GHz band.[2/] Two commenters also express a future interest in this band for use by intelligent transportation systems.[3/] Entities whose primary interest is the lower portion of the proposed allocation, at 5.15 to 5.35 GHz, also submitted comments.[4/]

2. Although a considerable number of commenters support the proposed allocation based on an apparent intent to develop, manufacture, and market NII/SUPERNet equipment,[5/] the record, viewed as a whole, raises

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1/ See Comments of American Radio Relay League, Inc. ("ARRL"); Northern Amateur Relay Council of California, Inc. ("NARCC"); San Bernardino Microwave Society ("SBMS"); Samuel F. Wood; and Bruce Perens.

2/ See Comments of Cylink Corporation ("Cylink"); Western Multiplex Corp. ("Western"); and Larus Corporation.

3/ See Comments of the Intelligent Transportation Society of America ("ITS America") and the U.S. Department of Transportation/Federal Highway Administration ("FHA").

4/ See Comments of AirTouch Communications, Inc. ("AirTouch"); Bell Atlantic; L/Q Licensee, Inc. ("LQL"); and COMSAT Corporation and ICO Global Communications ("COMSAT/ICO").

5/ See Comments of Apple Computer, Inc. ("Apple"); Consumer Electronics Manufacturers Association ("CEMA"); Hewlett-Packard Company ("H-P"); Lucent

(continued...)

substantial concerns about the proposal. Many commenters, including some manufacturers,[6] question whether the Commission's goals of creating wireless local area networks and facilitating wireless access to the National Information Infrastructure, can be achieved without causing interference to other existing and developing uses of the band. Engineering and consulting firms,[7] educators,[8] and public interest groups[9] also raise concerns that require careful consideration.

5/(...continued)
Technologies Inc. ("Lucent"); Microsoft Corporation ("Microsoft"); Rockwell International Corporation; Motorola, Inc. ("Motorola"); Northern Telecom Inc. ("Nortel"); Wireless Information Networks Forum ("WINForum"); Wireless LAN Alliance; 3Com Corporation ("3Com").

6/ See Comments of AT&T Corp. ("AT&T"); Harris Corporation - Farinon Division ("Harris"); and the Telecommunications Industry Association/Fixed Point-to-Point Communications Section, Network Equipment Division ("TIA").

7/ See Comments of Altstatt Associates ("Altstatt"); California Wireless, Inc. ("CWI"); Carnegie Mellon University/Department of Electrical and Computer Engineering ("Carnegie"); Fundamental Research Corp. ("FRC"); LACE, Inc./Chandos Rypinski; and Mulcay Consulting Associates ("Mulcay").

8/ See Comments of California State University et al.; North American Catholic Educational Programming Foundation; and the National School Boards Association et al.

9/ See Comments of Benton Foundation and Computer Professionals for Social Responsibility ("Benton/CPSR") and Wireless Field Tests ("WFT").

3. Most commenters do not disagree with the general NII/SUPERNet concept promoted by Apple and WINForum. There is considerable disagreement, however, about how the concept should be implemented, with debate on critical issues such as the amount of spectrum that needs to be allocated, the prospects for interference-free sharing with other users, and the appropriate technical parameters. A major recurring concern is the potential for interference between NII/SUPERNet devices and other beneficial users.

4. ReSound's principal concern in this proceeding is the effect that NII/SUPERNet devices may have on the 5.850-5.875 GHz band. ReSound terms this band the "Quiet Band" because, unlike other spectrum in the 5 GHz band which the Commission has proposed to allocate for NII/SUPERNet, the 5.850-5.875 GHz band is used exclusively for low power, short-range transmissions that cause no interference to other operations in the band. In its Comments, ReSound stated its belief that the NII/SUPERNet concept can be accommodated and can co-exist with existing users, <u>provided that</u> NII/SUPERNet devices are not permitted to operate in the 5.850-5.875 GHz band, and that ISM equipment continues to be accorded primary status in the 5.725-5.875 GHz band. ReSound also supports the Commission's proposal to limit NII/SUPERNet devices to 100 milliwatts peak EIRP.

5. The Comments reflect widespread agreement with ReSound's principal points.[10/] ReSound submits this reply principally to respond to comments that assert that NII/SUPERNet operations can co-exist in the Quiet Band. ReSound continues to urge the Commission not to proceed with an NII/SUPERNet allocation at the expense of the Quiet Band, and to permit NII/SUPERNet operations only on a low-power basis with appropriate sharing protocols in place to protect existing unlicensed operations.

II. The 5.850-5.875 GHz Band Should Not Be Included in the NII/SUPERNet Allocation

A. Spread Spectrum Transmitters Do Not Operate in the 5.850-5.875 GHz Band

6. It is imperative that the Commission not repeat the mistake of many commenters and overlook the distinction between the rules governing the Quiet Band -- i.e., the upper 25 MHz of the 5.8 GHz ISM band, at 5.850-5.875 GHz -- and the rules governing the remainder of the 5.8 GHz ISM band, at 5.725-5.850 GHz. Section 15.249 of the Commission's rules permits low-power unlicensed transmitters to operate in the Quiet Band, but does not allow use of this

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10/ See, e.g., Comments of AT&T at 3; Bell Atlantic at 2; PacTel at 4; Harris at 4; TIA at 10; ITS America at 2; ARLL at 6-8; and SBMS at para. 30.

band by spread spectrum transmitters of the type permitted by Section 15.247 of the rules.

7. The distinction between operations under Section 15.247 and Section 15.249 is critical if the Commission is to ensure that Section 15.249 transmitters continue to operate without interference, because the protocol proposed by the Commission for sharing between NII/SUPERNet devices and existing users would fail to prevent harmful interference to equipment operating in the Quiet Band under Section 15.249. NII/SUPERNet equipment conforming to the proposed spectrum etiquette cannot detect the presence of a Section 15.249 transmitter unless it is within 30 feet of that transmitter. Beyond 30 feet, NII/SUPERNet equipment conforming to the proposed etiquette protocol would proceed to transmit, causing harmful interference to any Section 15.249 receiver within 2.5 miles. Physical separation of the interfering equipment and signals will not resolve this interference.

8. The comments of many supporters of the NII/SUPERNet allocation ignore the unique protections enjoyed by the Quiet Band under Section 15.249, and assume that spread spectrum systems are permitted to operate in the entire 5.8 GHz ISM band, including 5.850-5.875. For example, Apple states that "one watt is the power now

permitted under Part 15 spread spectrum rules for use of the 5800 MHz ISM frequencies, whose frequencies match the upper portion of the proposed NII/SUPERNet Band."[11/] The upper limit of the proposed band is 5.875 GHz, however, whereas the upper limit for Section 15.247 equipment is 5.850 GHz. Similarly, several equipment manufacturers reference ET Docket No. 96-8,[12/] in which the Commission has proposed to eliminate the current limit in Section 15.247 on directional gain antennas for certain spread spectrum transmission systems, and suggest that NII/SUPERNet devices be permitted to operate at the same power limits proposed therein.[13/] However, these commenters apparently assume that higher power spread spectrum operations also have been proposed

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11/ Comments of Apple at 7 (emphasis added), citing 47 C.F.R. § 15.247. Apple's Comments also present a chart showing "Pt. 15 (low power)" encompassing only the 5.850-5.875 GHz band. In fact, Section 15.249 equipment may operate from 5.725-5.875 GHz; the lower 125 MHz may be used by Section 15.249 devices in the absence of equipment operating pursuant to Section 15.247, while the upper 25 MHz Quiet Band may be used by Section 15.249 devices in the presence of Section 15.247 devices to avoid mutual interference. See 47 C.F.R. § 15.249. An accurate representation of the subject spectrum is contained in FCC OET Bulletin No. 63, "Understanding the FCC Regulations for Low-Power, Non-Licensed Transmitters," December 1994, p. 25.

12/ Amendment of Parts 2 and 15 of the Commission's Rules Regarding Spread Spectrum Transmitters, Notice of Proposed Rule Making, 11 FCC Rcd 3068 (1996).

13/ See, e.g., Comments of Apple at 7-8; Nortel at 9; Motorola at 8-9; Microsoft at 3; WINForum at 19.

above 5.850 GHz, which is not the case; spread spectrum transmission systems permitted under Section 15.247 are not allowed to operate in the Quiet Band.

9. In sum, the Commission has not proposed to alter existing protections for the Quiet Band in ET Docket No. 96-8, and this precedent should be followed here. The Commission not only should reject requests to allow high power operations in the Quiet Band, but should prohibit NII/SUPERNet operations in the Quiet Band altogether.

B. No Commenter Has Addressed Potential Interference with Section 15.249 Equipment

10. The misunderstanding by certain commenters of the difference between Section 15.247 and Section 15.249 operations clearly indicates that their advocacy of the entire ISM band for NII/SUPERNet operations is based, at least in part, on their failure to duly consider and analyze the potential for interference to Section 15.249 equipment.

11. Apple's Comments include a proposal to divide what it terms the "NII/SUPERNet Band" into two sub-bands: one (in fact a bifurcated band) for "very high rate" ("VHR") systems at 5.150-5.250 GHz and 5.825-5.875 GHz, and another (also bifurcated band) that would operate under more flexible technical rules at 5.250-5.350 and 5.725-5.825

GHz.[14] As proposed by Apple, VHR systems would be high speed (20 Mbps or greater), low power, low power spectral density, short-range, primarily indoor LANs. According to Apple, "[r]eserving an upper VHR sub-band [at 5.825-5.875 GHz] would provide ... protection to FSS uplinks operating at 5.850-5.875 and low power unlicensed operations operating under Part 15.249 of the rules."[15] While Apple's proposal may serve to reduce interference with operations in certain portions of the 5 GHz band, Apple has provided no description or analysis of how Section 15.249 equipment would be protected.

C. Disturbing the Quiet Band Would Disrupt Numerous Beneficial Users

12. The Comments indicate that a variety of existing users of spectrum in the 5.850-5.875 would be affected by an NII/SUPERNet allocation in that band. In addition to ISM applications, including hearing healthcare products such as those developed by ReSound, amateur radio service operators and fixed satellite services also use the band for beneficial purposes.[16] All of these users presently co-exist without interference. And, ITS America

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14/ Comments of Apple at 10-16.

15/ Comments of Apple at 14.

16/ See, e.g., Comments of ARLL at 4-5; Apple at 14.

and the FHA state that the Quiet Band soon will be the subject of a request for allocation for Intelligent Transportation Systems, which, the proponents state, can co-exist with existing users, but not with NII/SUPERNet devices.

13. As ReSound indicated in its Comments, the Quiet band has significant importance for the $2 billion hearing healthcare industry, and the inability to develop the band may slow the development of the industry. Technical characteristics of the band hold particular promise in offering advanced solutions for the hearing impaired, and the proposed sharing of the band with NII/SUPERNet devices threatens these beneficial advancements. ReSound urges the Commission to confirm, as it has on several recent occasions, the public policy importance of assuring that telecommunications policy is set with due regard for the needs of disabled Americans.[17/]

17/ See "Building Bridges to the Information Superhighway," Federal Communications Commission Annual Report of the Disabilities Issues Task Force, April 26, 1996. In WT Docket No. 95-56, the Commission recently allocated the 216-217 MHz band for, inter alia, short-range, low-power auditory assistance devices. Report and Order, released August 2, 1996. However, such operations will be on a secondary basis; furthermore, hearing aids operating in lower spectrum bands cannot benefit from miniaturization and are most beneficial only in fixed classroom settings. Primary, non-interference operations in the Quiet Band offer unique opportunities (continued...)

14. The 5.850-5.875 GHz band plainly can accommodate diverse technologies and uses. It has not been shown that NII/SUPERNet devices can co-exist with existing operations in the Quiet Band. Consequently, the NII/SUPERNet allocation should not include the Quiet Band.

D. **A 350 MHz Allocation Is Not Warranted**

15. Eliminating the 5.850-5.875 GHz band from the proposed NII/SUPERNet allocation is unlikely to diminish in any significant way the development of NII/SUPERNet networks or the benefits that may be derived from such networks that are championed by their proponents. As Apple acknowledges, the "development and definition of [NII] technologies and standards are in a very early, formative stage...."[18/] As a result, none of the NII/SUPERNet advocates, including Apple and WINForum, has been able to state with any precision or clarity why such a substantial amount of spectrum -- 350 MHz -- is necessary at this time.

16. A number of commenters point out that many technologies and frequency bands offer alternatives to

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17/(...continued)
to advance the needs of hearing impaired individuals that are not achievable at lower frequencies.

18/ Comments of Apple at n.15.

NII/SUPERNet at 5 GHz.[19] The Commission should study these comments carefully before making an initial allocation for NII/SUPERNet. For example, Benton notes that infrared technology can meet some of the needs for wireless networks, thereby greatly reducing the NII/SUPERNet allocation.[20] Similarly, Cylink argues that there are several alternative frequency bands that can be used for short-range wireless LANs and longer-range outdoor operations.[21] Western notes that longer-range unlicensed operations already are possible using Section 15.247 transmitters and believes that 200 MHz is a sufficient NII/SUPERNet allocation.[22]

17. In view of the significant number of commenters who reject as excessive the Commission's proposal to allocate 350 MHz of spectrum for NII/SUPERNet,[23] eliminating the Quiet Band -- just 25 MHz -- from the NII/SUPERNet allocation is not unreasonable and should not impede the development of NII/SUPERNet systems.

19/ See, e.g., Comments of Cylink at 2-4; Western at 2; Benton at 6.

20/ Comments of Benton at 6.

21/ Comments of Cylink at 2.

22/ Comments of Western at 2.

23/ See, e.g., Comments of Benton at 5-7; Western at 2-3; Altstatt at 1-2; PacTel at 3; ReSound at 15; ARLL at 4-5; NARCC at 4; LQL at 12.

III. NII/SUPERNet Systems Can Operate in the 5.725-5.850 ISM Band With Appropriate Technical Protections for Existing Users

18. As noted, Apple has suggested one set of technical standards for low power "VHR" NII/SUPERNet devices operating in the 5.150-5.250 GHz and 5.825-5.850 GHz bands, and a separate set of technical standards for "non-VHR" NII/SUPERNet devices operating in the 5.250-5.350 and 5.725-5.825 GHz bands. Provided that the Quiet Band is not included in the NII/SUPERNet allocation, ReSound does not oppose allowing VHR devices to operate below 5.850 GHz. However, ISM equipment must continue to have primary status, the remainder of the ISM band (5.725-5.850 GHz) must be restricted to low-power VHR devices, and an etiquette protocol that is fair to all users must be agreed upon.

A. NII/SUPERNet Operations Should Be Restricted to Low Power, As Proposed

19. Only a handful of commenters expressly advocate "community networks" at powers of 1 watt or greater.[24/] As noted, however, most of these commenters have assumed that 1

24/ See Comments of Apple at 7; CEMA at 5; Microsoft at 3-4; Motorola at 8; WINForum at 22-25; Lucent at 2 (supporting WINForum); FRC at 1-2; Mulcay at 4.

watt operations are permissible in the entire 5 GHz ISM band,[25] which has been shown to be incorrect.

20. Many commenters believe that low power (0.1 watt) systems as proposed by the Commission are appropriate to avoid interference with existing and proposed uses.[26] ReSound does not oppose higher-power (1 watt) NII/SUPERNet operations in the 5.725-5.850 GHz band, provided such operations are consistent with Section 15.247, which grants primary status to ISM devices.

21. ReSound disagrees with those commenters who suggest that NII/SUPERNet devices should be permitted to operate at the same power levels that have been proposed for spread spectrum systems in ET Docket No. 96-8.[27] The NPRM contains no such proposal, reflecting the Commission's

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25/ E.g., Comments of WINForum at 22 ("the proposed power limits should be revised to permit deployment of directional transmit antennas and the power limit for the ISM band should be conformed to the spread spectrum device limits"); Apple at 14.

26/ See Comments of 3Com at 10-11; Bell Atlantic at 1-2; ARLL at 8; PacTel at 3; SBMS at para. 30; AT&T at 3; Harris at 4; Western at 5; TIA at 4; FHA at 2; ITS America at 2; LWL at 20; ICO/COMSAT at 5; Altstatt at 1; CWI at 1-2; NARCC at 5; Samuel Wood at 2; Bruce Perens at 2. See also Comments of Carnegie at 1 (expressing concern about interference caused by high-power outdoor NII/SUPERNet devices).

27/ E.g., Comments of WINForum at 22; Nortel at 9.

determination that such operations are more appropriate in licensed spectrum bands.

B. Further Study on the Commission's Proposed Listen-Before-Talk Protocol Is Necessary

22. The Comments reflect sharp differences on the Commission's proposal to adopt a listen-before-talk protocol for sharing spectrum between NII/SUPERNet devices and other users. Several commenters believe that the proposal would not effectively control interference or would be too restrictive.[28/] WINForum agrees that the proposed standard may not be appropriate, and states that it is engaged in efforts to achieve a consensus among manufacturers on sharing rules.[29/] Other commenters argue that the standard setting process should not be limited to manufacturers only.[30/] The Commenters also disagree on whether there should be an interim standard pending adoption of a

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28/ See Comments of Motorola at 2-7; Bell Atlantic at 2; H-P at 3.

29/ Comments of WINForum at 21-22.

30/ Comments of Benton/CPSR at 8.

permanent protocol,[31/] and whether the Commission should adopt a mandatory or voluntary standard.[32/]

23. The range of disagreement over the viability and implementation of an NII/SUPERNet sharing protocol suggests that additional study is necessary before a permanent standard can be adopted. ReSound believes this should be accomplished in a negotiated rulemaking proceeding overseen by the Commission, which would be open not only to manufacturers of NII/SUPERNet equipment but to all interested and affected parties.

IV. Conclusion

24. ReSound continues to believe that a solution to the problem of interference to the Quiet Band caused by NII/SUPERNet devices is readily achievable by eliminating the Quiet Band from the NII/SUPERNet allocation, and protecting existing allocations in the remainder of the 5.8 GHz ISM band. This will substantially accommodate the Apple and WINForum proposals without harming other beneficial users of the band.

31/ Compare Comments of Nortel at 10-11 with Comments of H-P at 4-5 and Lucent at 5.

32/ Compare Comments of Microsoft at 6 with Comments of 3Com at 8.

WHEREFORE, the foregoing premises duly considered, ReSound urges the Commission to adopt rules in this proceeding consistent with the Comments and Reply Comments of ReSound Corporation.

Respectfully submitted,

RESOUND CORPORATION

By: E. Ashton Johnston

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August 14, 1996

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CERTIFICATE OF SERVICE

I Nadine Smith-Garrett, a secretary with the law firm of Paul, Hastings, Janofsky & Walker LLP, hereby certify that a copy of the foregoing Reply Comments of Resound Corporation was sent first class, postage prepaid, United States mail on August 14, 1996 to the following:

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